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Fax message

To	**Paul Rodriguez**	Location	
cc		Fax	**571-273-3753**
From	**Kerry Morris**	Date	**February 15, 2008**
Subject	**U.S. Serial No. 10/708,719**	Pages (inc)	**3**

Mr. Rodriguez,
I am attaching the 18 formulas for the referenced patent application. Please let me know if these are unclear.

Sincerely yours,

Kerry Morris

$$E\left(\overline{\sigma_f}\right)=\sum_{j=1}^{4}\frac{\left|\sigma_{\text{meas}}^{j}-\sigma_{\text{model}}^{j}\left(\sigma_m,\overline{\sigma_f},r,s\right)\right|^2}{\varepsilon^{j}}. \quad (1)$$

$$V_m^i+V_h^i=0, \quad (2)$$

$$\mathbf{V}=\begin{bmatrix} V_{xx} & V_{xy} & V_{xz} \\ V_{yx} & V_{yy} & V_{yz} \\ V_{zx} & V_{zy} & V_{zz} \end{bmatrix}, \quad (3)$$

$$\mathbf{V}=\begin{bmatrix} V_{xx} & 0 & V_{xz} \\ 0 & V_{yy} & 0 \\ V_{zx} & 0 & V_{zz} \end{bmatrix} \quad (4)$$

$$\begin{bmatrix} V_{xz} \\ V_{yz} \\ V_{zz} \end{bmatrix} \quad (5)$$

$$\begin{bmatrix} V_{xx} & V_{xy} & V_{xz} \\ V_{yx} & V_{yy} & V_{yz} \\ V_{zx} & V_{zy} & V_{zz} \end{bmatrix} \quad (6)$$

$$E_T\left(\overline{\sigma_{fh}},\overline{\sigma_{fv}}\right)=\sum_{j=1}^{4}\sum_{i=1}^{N}\frac{\left|\sigma_{meas}^{ij}-\sigma_{model}^{ij}\left(\sigma_m,\overline{\sigma_{fh}},\overline{\sigma_{fv}},r,\alpha,s\right)\right|^2}{\varepsilon^{ij}}, \quad (7)$$

$$\overline{\overline{\sigma}}_{appa}=\begin{bmatrix} \sigma_{xx} & \sigma_{xy} & \sigma_{xz} \\ \sigma_{yx} & \sigma_{yy} & \sigma_{yz} \\ \sigma_{zx} & \sigma_{zy} & \sigma_{zz} \end{bmatrix} \quad (8)$$

$$\overline{\overline{\sigma}}_{appa}=\begin{bmatrix} \sigma_{\text{hom}} & 0 & 0 \\ 0 & \sigma_{\text{hom}} & 0 \\ 0 & 0 & \sigma_{\text{hom}} \end{bmatrix}. \quad (9)$$

$$R = \begin{bmatrix} \cos\phi & -\sin\phi & 0 \\ \sin\phi & \cos\phi & 0 \\ 0 & 0 & 1 \end{bmatrix} \tag{10}$$

$$\overline{\overline{\sigma}}'_{appa} = R\,\overline{\overline{\sigma}}_{appa}R^{T}. \tag{11}$$

$$\overline{\overline{\sigma}}_{appa} = \begin{bmatrix} \sigma_{xx} & 0 & \sigma_{xz} \\ 0 & \sigma_{yy} & 0 \\ \sigma_{zx} & 0 & \sigma_{zz} \end{bmatrix}. \tag{12}$$

$$\overline{\overline{\sigma}}'_{appa} = R\begin{bmatrix} \sigma_{xx} & 0 & \sigma_{xz} \\ 0 & \sigma_{yy} & 0 \\ \sigma_{zx} & 0 & \sigma_{zz} \end{bmatrix}R^{T} = \begin{bmatrix} \sigma_{xx}\cos^2\phi + \sigma_{yy}\sin^2\phi & \left(\sigma_{xx}-\sigma_{yy}\right)\sin\phi\cos\phi & \sigma_{xz}\cos\phi \\ \left(\sigma_{xx}-\sigma_{yy}\right)\sin\phi\cos\phi & \sigma_{xx}\sin^2\phi + \sigma_{yy}\cos^2\phi & \sigma_{xz}\sin\phi \\ \sigma_{zx}\cos\phi & \sigma_{zx}\sin\phi & \sigma_{zz} \end{bmatrix}. \tag{13}$$

$$\phi_a = -\arctan\left(\frac{\sigma_{yz}}{\sigma_{xz}}\right). \tag{14}$$

$$\phi_b = -\arctan\left(\frac{\sigma_{zy}}{\sigma_{zx}}\right) \tag{15}$$

$$\phi_c = \arctan\left\{\frac{\sigma_{xx}-\sigma_{yy} \pm \sqrt{\left(\sigma_{xx}-\sigma_{yy}\right)^2 + 4\sigma_{xy}\sigma_{yx}}}{2\sigma_{xy}}\right\}, \tag{16}$$

$$\phi_d = \arctan\left\{\frac{\sigma_{xx}-\sigma_{yy} \pm \sqrt{\left(\sigma_{xx}-\sigma_{yy}\right)^2 + 4\sigma_{xy}\sigma_{yx}}}{2\sigma_{yx}}\right\}. \tag{17}$$

$$\overline{\overline{\sigma}}_{corr} = R^{T}\,\overline{\overline{\sigma}}'_{corr}\,R. \tag{18}$$